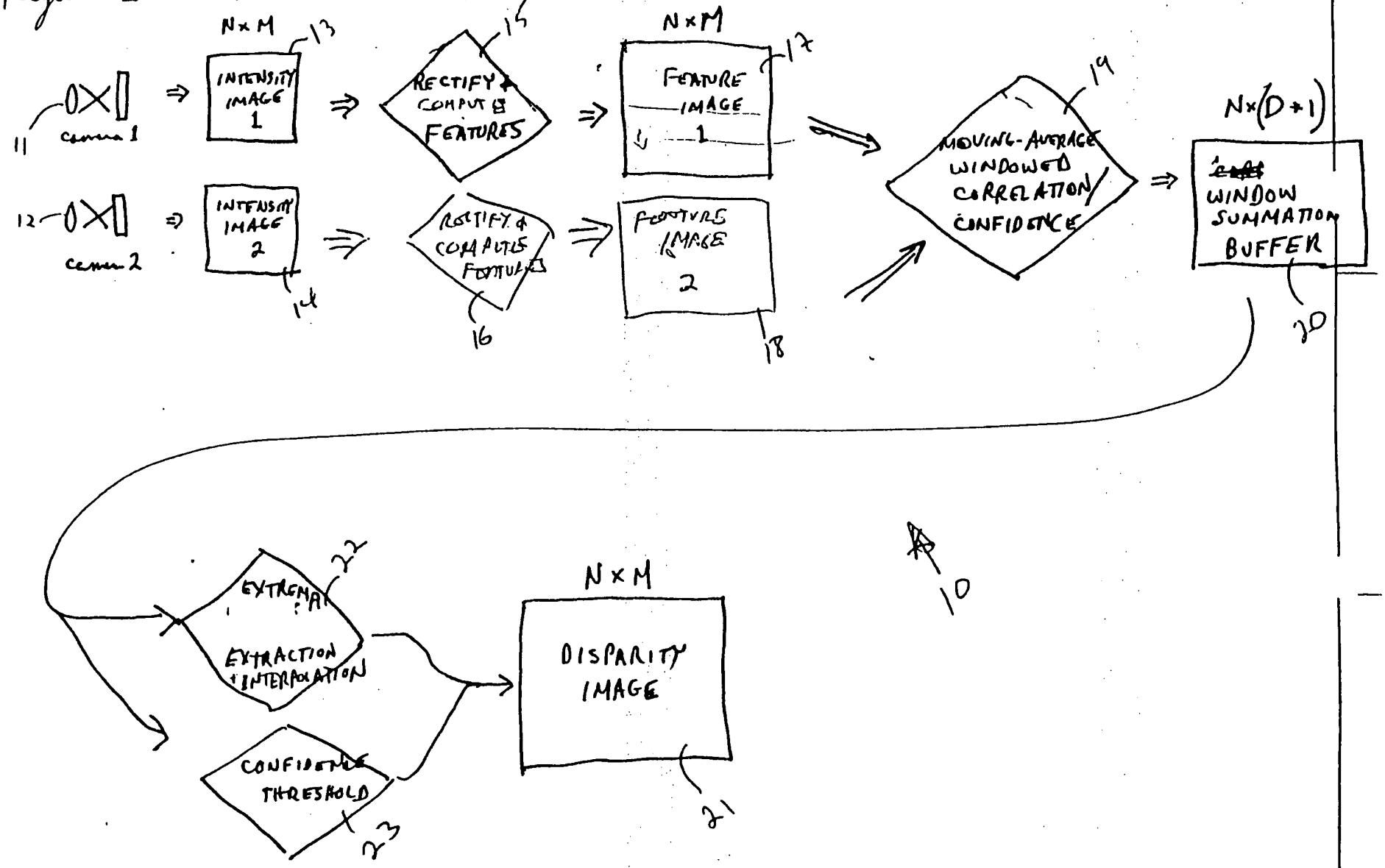
Figure 1.


N×M
INTENSITY IMAGE 1
RECTIFY & COMPUTE FEATURES
N×M
FEATURE IMAGE 1
MOVING-AVERAGE WINDOWED CORRELATION/ CONFIDENCE
N×(D+1)
WINDOW SUMMATION BUFFER
camera 1
camera 2
INTENSITY IMAGE 2
RECTIFY & COMPUTE FEATURES
FEATURE IMAGE 2
EXTREMA EXTRACTION & INTERPOLATION
CONFIDENCE THRESHOLD
N×M
DISPARITY IMAGE
10
11
12
13
14
15
16
17
18
19
20
21
22
23

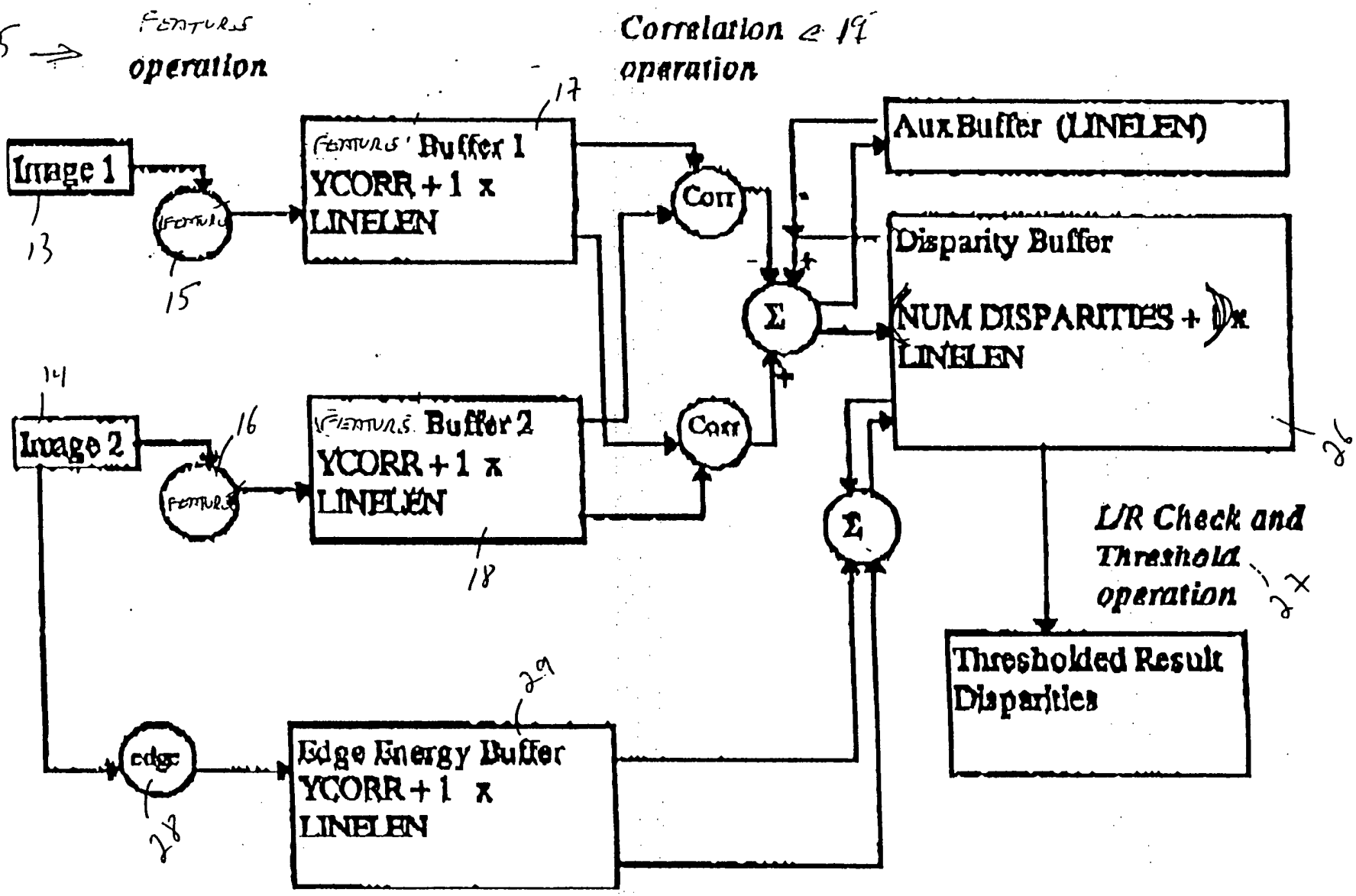

25
Features operation
Correlation & LR operation
Image 1
13
Features
15
Features Buffer 1
YCORR + 1 x LINELEN
17
Corr
AuxBuffer (LINELEN)
Disparity Buffer
NUM DISPARITIES + 1 x LINELEN
26
Σ
14
Image 2
16
Features
Features Buffer 2
YCORR + 1 x LINELEN
18
Corr
Σ
L/R Check and Threshold operation
27
Thresholded Result Disparities
edge
28
Edge Energy Buffer
YCORR + 1 x LINELEN
29

Figure 2

Figure 3

Fig. 3(a)

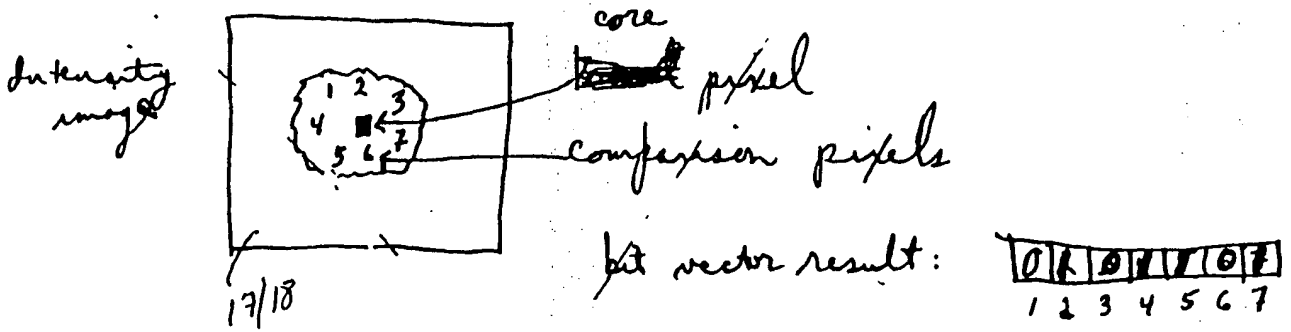


Fig. 3(b)

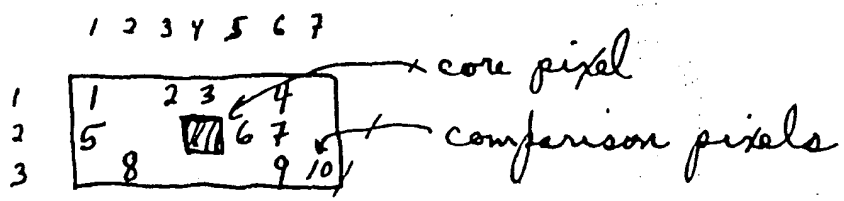


Figure 4

Fig. 4 (a)

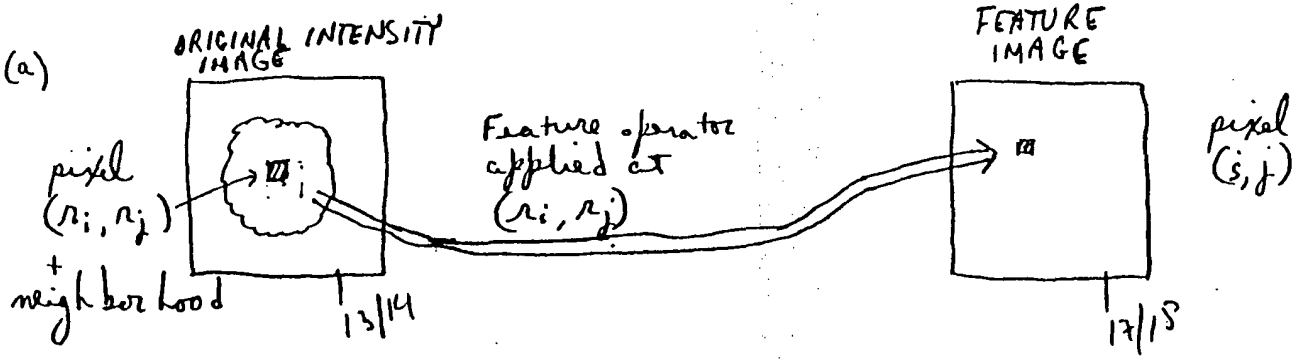


Fig. 4 (b)

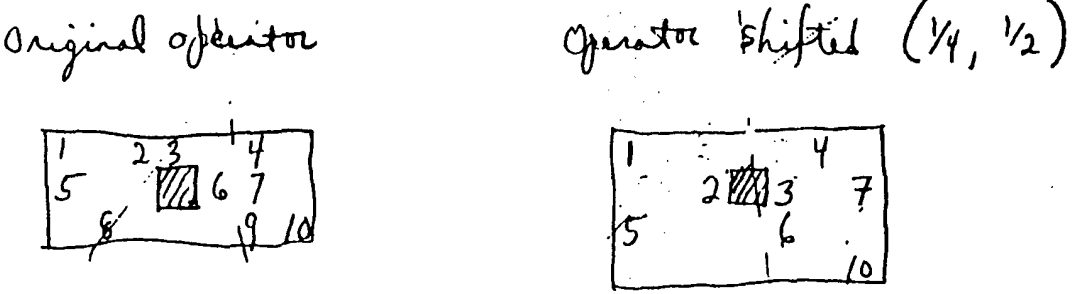


Figure 4

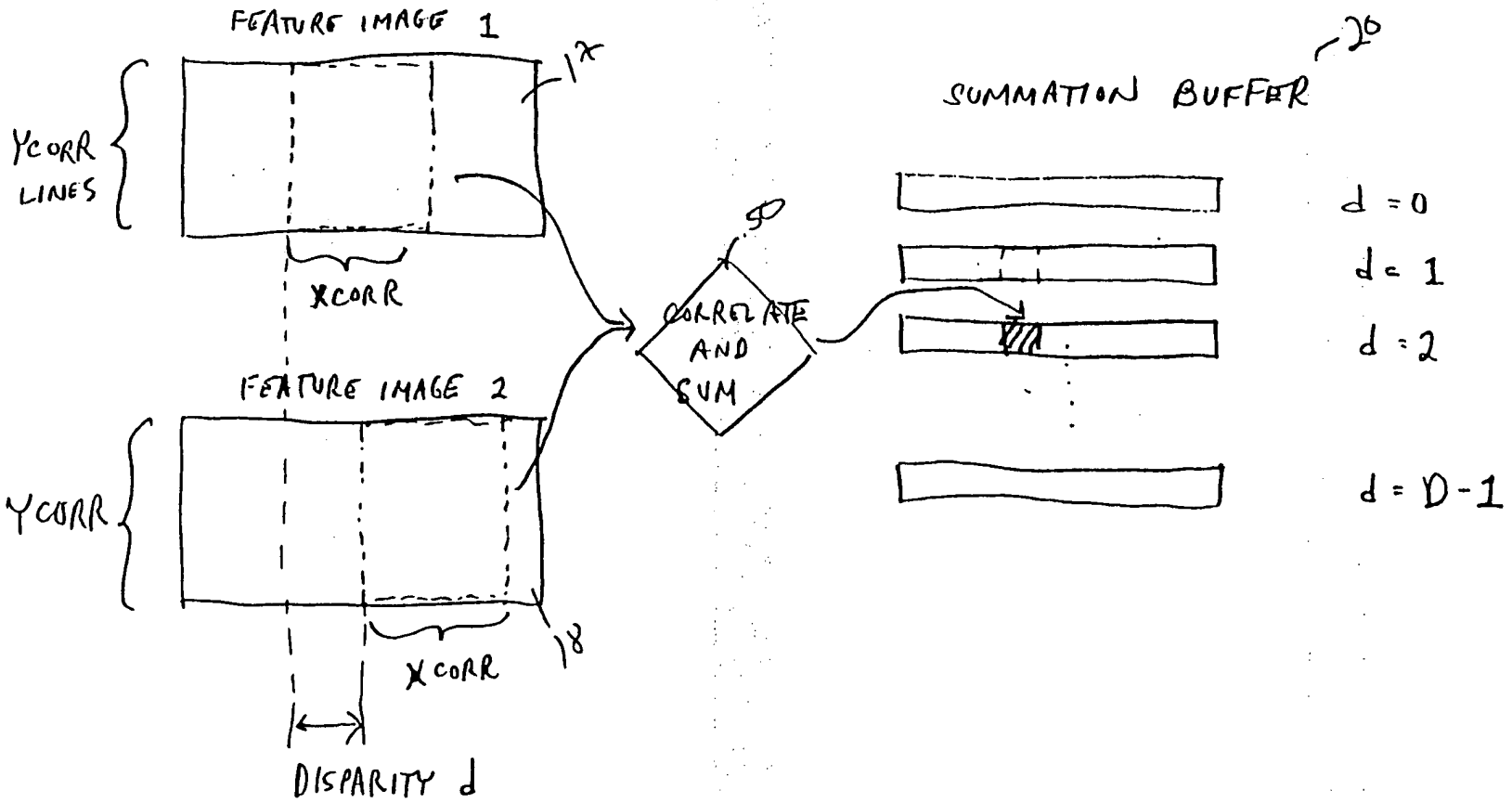

FEATURE IMAGE 1
16
YCORR LINES
XCORR
FEATURE IMAGE 2
YCORR
XCORR
18
DISPARITY d
CORRELATE AND SUM
20
SUMMATION BUFFER
d = 0
d = 1
d = 2
d = D-1

Figure 6

Fig. 6 (a)

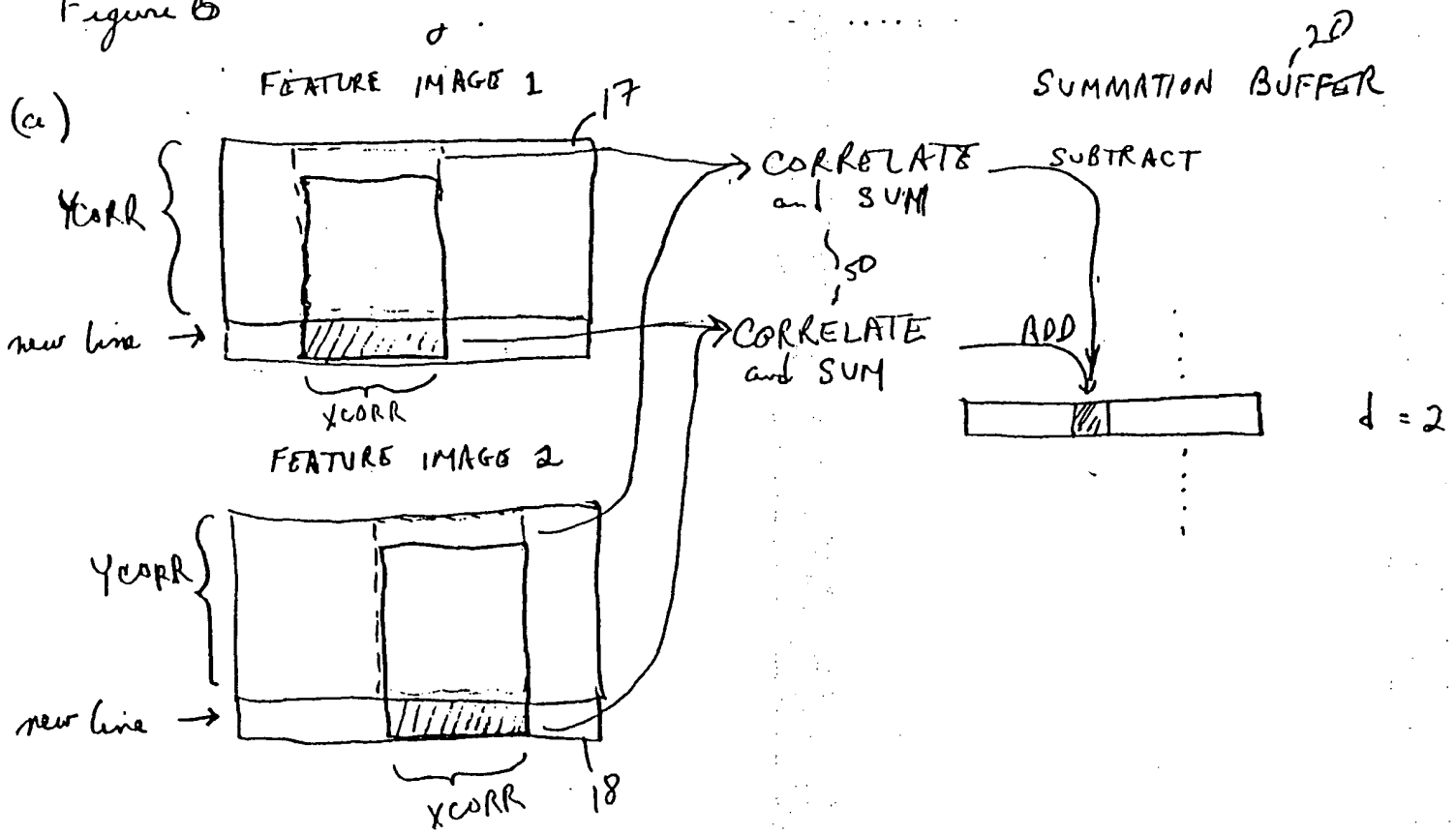


Fig. 6 (b)

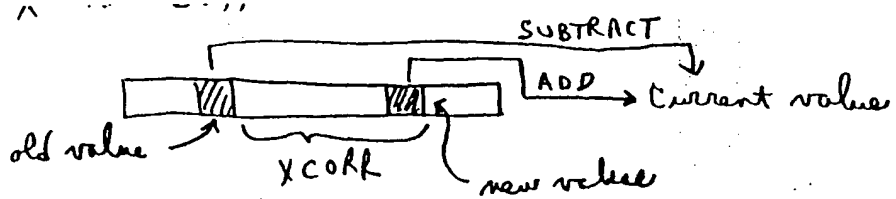


Figure 7

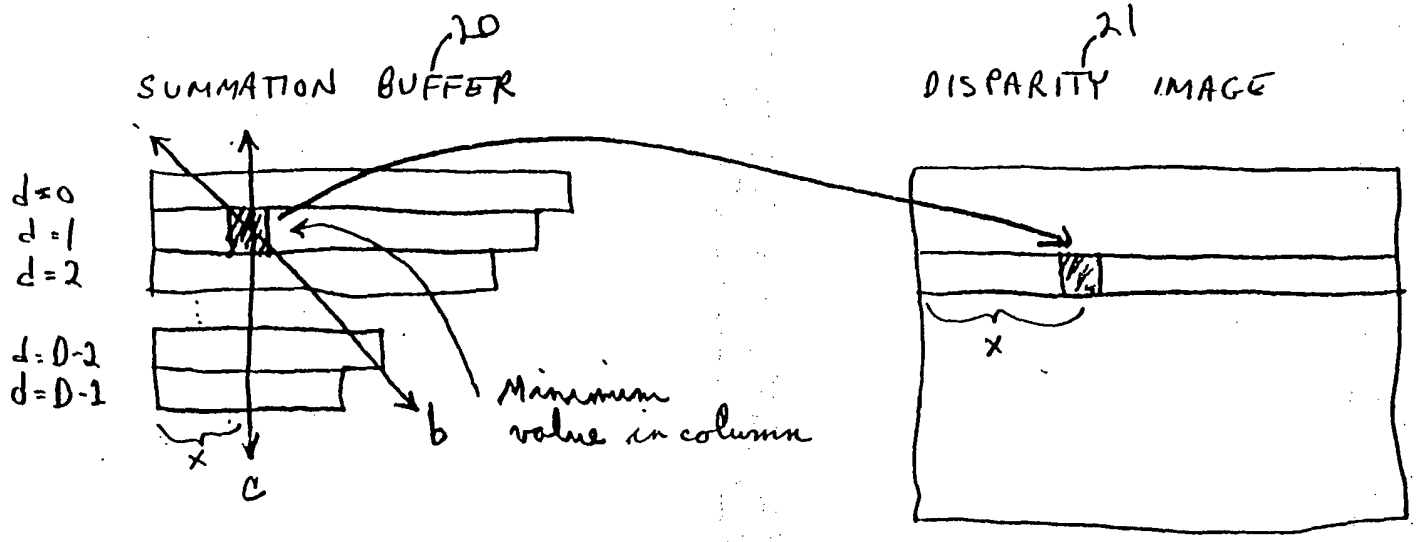
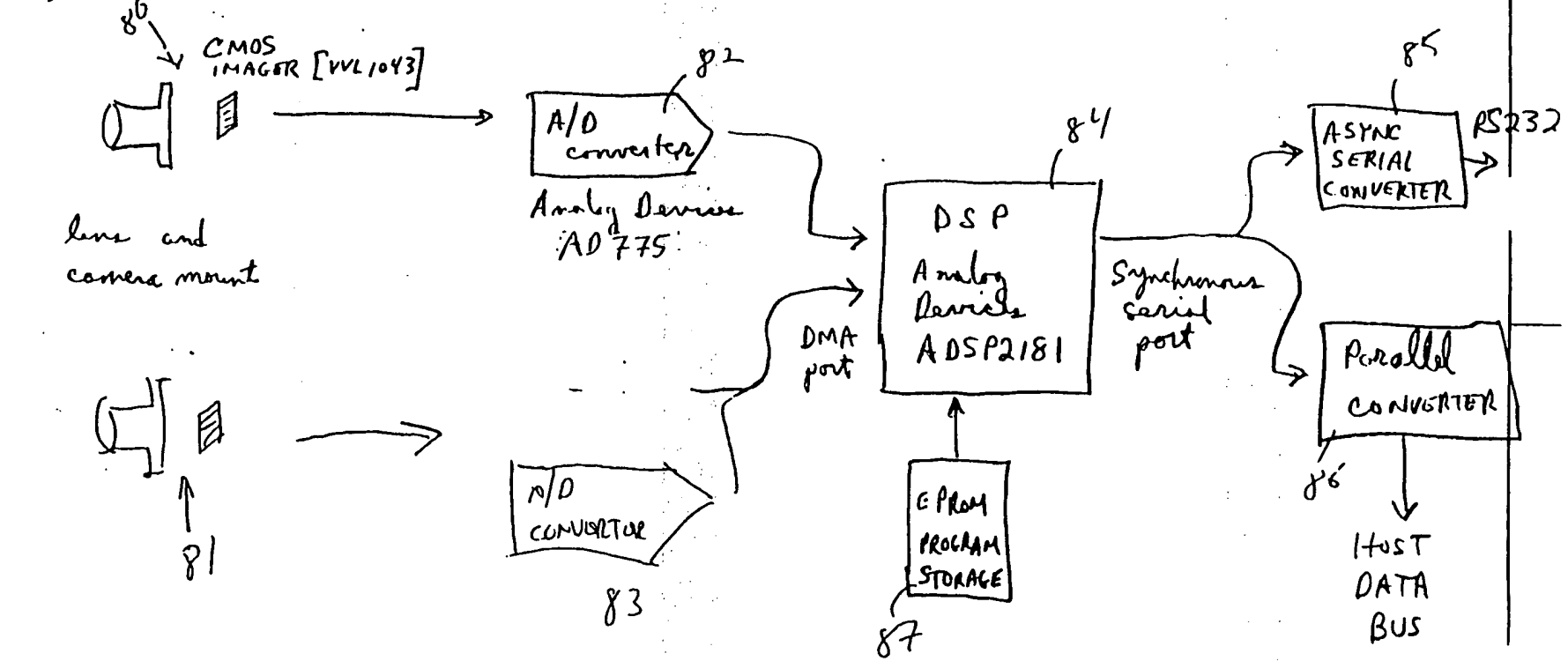

20
SUMMATION BUFFER
21
DISPARITY IMAGE
d=0
d=1
d=2
d=D-2
d=D-1
x
c
b
Minimum value in column
x

Figure 8


86
CMOS IMAGER [VVL1043]
lens and camera mount
82
A/D converter
Analog Devices AD775
81
A/D CONVERTER
83
DMA port
84
DSP
Analog Devices ADSP2181
EPROM PROGRAM STORAGE
87
Synchronous serial port
85
ASYNC SERIAL CONVERTER
RS232
Parallel CONVERTER
86
HOST DATA BUS